MATHEMATICS

On two new notions of finiteness.

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We introduce two set-theoretic properties, P and P^*, which are definitions of finiteness in the sense that, if the the axiom of choice (AC) is assumed, then a set satisfies either property if and only it is finite. We study the two definitions in set theory without AC and, in particular, derive a relation of implication between the two. We finish by looking at how they relate to the well-known notions of finiteness due to Tarski, Lévy, and Dedekind.